Name_____

Date_____Block_____

REVIEW – Exponential Functions

A. GROWTH OR DECAY

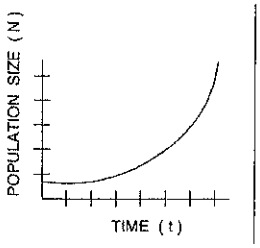
Classify the following as growth or decay.

1) $y = -2(3)^x$ 2) $f(x) = 7\left(\frac{1}{3}\right)^x$ 3) $f(x) = 0.6(2)^x$ 4) $y = 100(0.7)^x$

5) $f(x) = 6(1.2)^x$ 6)

x	y
0	10
1	5
2	5/2

7)



B. PERCENT GROWTH AND DECAY – Word Problems

1) An account starts with $250 and appreciates 5% each year.

a. Growth or decay?

b. Write an equation to model the situation.

c. How much money will be in the account after 6 years?

2) A rabbit population begins dying off at a rate of 8% each year. There were 500 rabbits initially. How many will there be at the end of 2 years?

3) A mutual fund with $8,500 depreciates 14% every 2 years. Write an equation, m(y), to model the amount of money left in the account after *y* years.

C. EXPONENT RULES

Simplify

1) $f^8 \cdot f^2 \cdot f$ 2) $\frac{3y^5}{y^2}$ 3) $(5h^4)^2$ 4) Rewrite r^{-5}

5) b^0 6) $3x^2 + 5x$ 7) $2x^3 + x^3$

Name_____

Date_____Block_____

D. GRAPHING EXPONENTIAL FUNCTIONS

Graph the following. Your graph must contain at least 3 specific points.

1) $y = 6(2)^x$

2) $f(x) = 12\left(\frac{1}{2}\right)^x$

E. SOLVING EXPONENTIAL EQUATIONS

1) $4^{7x+2} = 16$

2) $3^{-x+2} = 1$

3) $9^{x+2} = 9^{3x+1}$

4) $5^{6x} = \frac{1}{125}$

5) $4^{x-1} = 8^{3x}$

F. MODELING – Word Problems

1) When Violet Beauregard turns into a blueberry, she doubles in size every 9 minutes. Normally, Violet is 5 feet tall.

A. Does this situation represent growth or decay?

B. Write an equation, h(m), to represent Violet's height, h, after m minutes.

C. If it takes Violet 18 minutes to get to the juicer, how big will she be?

2) Every hour, half of my 1,000 initial bacteria die off. How many bacteria will be left after 6 hours?

G. WRITING EQUATIONS FROM A TABLE

Write the exponential equation to fit each table:

1)

x	y
–1	80
0	20
1	5
2	5/4

2)

x	y
–1	5
0	10
1	20
2	40

Name_____

Date_____Block_____

H. WRITING EQUATION GIVEN 2 POINTS

Write the exponential equation to fit each pair of points.

1) Through $(0,4)$ and $(1,24)$

2) Through $(0,8)$ and $(2,2)$

3) Through $(1,7)$ and $(2,21)$

4) Through $(0,6)$ and $(4,62)$

I. Even More Modeling

1) The state of Michigan is gathering data on the deer population. At the first census, there are 75,000 deer in the state. After the next census 2 years later, the number of deer decreased to 62,500 deer. Write an equation that models the deer population (p) based on the number of years (x) that have passed.

2) If there are 300 bacteria in a petri dish and they triple in population every 4 hours, write an expression f(n) to represent the number of bacteria in the dish n hours from now.

3) The EPA now requires that factories reduce their waste output by 8% each year from the preceding year. If a company is currently producing 4,500 pounds of waste in the year prior to starting the program, write a formula, f(n), that represents their waste output during year n of the program.

4) A car valued at $35,000 today is depreciating in value exponentially at a rate of 22% each year. Write an expression to represent the expected value of the car in 10 years.

Name_____

Date_____Block_____

J. Logarithm Basics

Write the following logarithmic expressions in exponential form.

1) $\log_7 49 = 2$ 2) $\log_5 x = 3$ 3) $\log 1{,}000 = 3$ 4) $\log_x a = y$

Write the following exponential expressions in logarithmic form.

5) $4^3 = 64$ 6) $8^x = 1$ 7) $10^x = y$ 8) $x^c = h$

K. Using Logarithms

1) Someone puts $\log_5(x+2) = 0$. Write out this logarithm in exponential form, then solve the equation.

2) Using logarithm rules, write each expression as a single logarithm:

A. $\log 10 + \log 100 =$ B. $\log 10 - \log 100 =$ C. $10 \cdot \log 10$

3) Evaluate

A. $\log_2 8$ B. $\log_3 \frac{1}{27}$ C. $e^{\ln 8}$

4) Solve

A. $\log_5 x = 6$ B. $\log_4(x+6) = \log_4(2x)$ C. $\log_2 6 + \log_2 c = \log_2 15$